

II. NATURAL RESOURCE ISSUES IN THE ACEC

The following sections (unless otherwise noted) are abbreviated summaries from the *Parker River/Essex Bay Area of Critical Environmental Concern Resource Inventory* prepared by CZM in spring, 2000 (Busse 2000). To receive a copy of the resource inventory, contact the CZM North Shore Regional Office at 978-281-3972. For a list of agencies and organizations that can offer assistance for these issues, refer to Appendix A.

WATERSHED PROTECTION

River networks in the Parker, Ipswich, and North Coastal watersheds connect resources in the Parker River/Essex Bay ACEC. The Parker River Watershed encompasses 83 square miles and is bordered by the Merrimack River Watershed to the north and the Ipswich River Watershed to the south. Water flow in the Parker River is reduced to a trickle in the summer and may cease completely in certain segments during years of low precipitation. Dams and low water supply especially impact anadromous fish runs in this watershed. Communities within the Parker River Watershed are mostly rural in character with low-density housing and many farms. However, land use is changing as the population in the watershed increases each year. With additional commercial and residential development come greater concerns of water quality problems and loss of open space.

The Ipswich River Watershed encompasses 155 square miles. Along its course, the river and tributaries flow through wetlands that help maintain good water quality. These wetlands and the watershed's groundwater provide much of the river's flow during drier times of the year. Water use efficiency and conservation is a great concern in the region since portions of the river run dry in the summer especially during times of drought and high water withdrawal. Shellfish and anadromous fish runs in tidal portions of the river also rely on adequate water supply and quality. Most of the watershed is forested while a smaller percentage is made up of residential, industrial, and commercial development.

The North Coastal Watershed encompasses 168 square miles along the coast from Boston to the North Shore. The dominant resource industries in the upper North Shore ACEC communities of Essex and Gloucester include commercial fishing for finfish, lobsters, and shellfish harvesting. As in other ACEC watersheds, water quality in tidal portions of the Essex River and in Essex Bay is a concern to shellfish harvesters. These two ACEC communities in the North Coastal Watershed have retained their scenic and environmental character, but are also being faced with increasing threats of suburban sprawl and loss of open space. *See Appendix A for watershed organization and agency contact information.*

WATER SUPPLY

(Information derived through assessment interviews)

Over the last 15 years, ACEC towns have experienced significant population growth, with resulting impacts on water supplies. For some communities, supplying adequate water for the future is a matter of protecting and developing local groundwater resources. However, in the Ipswich River Watershed, the



Photo by Robert Buchsbaum



situation is more complicated. A number of water sources that draw from the Ipswich River are being stretched beyond their capacity to supply water particularly during extended dry periods. Moreover, there is competition between the water supply needs of communities and the needs of recreation, agriculture, industry, business, and fisheries and wildlife. Much of the public is unaware of the source of its water supply, the limitations, and the sustainable measures necessary to assure a continued supply.

Intensive conservation efforts and public education are effective ways to change water use habits. Technical assistance and grants from state and regional planning agencies are available to help local governments create and carry out water supply protection plans, including leak detection and system rehabilitation and aquifer land acquisition opportunities. *Refer to Appendix A for a list of agencies and organizations that focus on water supply issues.*



WATER QUALITY

Water quality within the ACEC varies depending on the location. While water quality in certain parts of the Ipswich River has improved, it has declined in tributaries to the Parker River. Impacts to tributary water quality include decreased open space, degradation of wetlands that filter pollutants, and changes in surrounding land use patterns that increase impervious surfaces. Fecal coliform bacteria, which are common indicators of disease-causing bacteria and viruses from human and animal wastes, are generally found in higher concentrations in rivers and tributaries after periods of heavy rainfall. Potential sources of bacterial pollution in ACEC waters include wastewater treatment facilities, stormwater runoff, faulty or improperly maintained septic systems, and agricultural runoff. Plum Island Sound and Essex Bay continue to have low to moderate levels of pollutants and consistently have better water quality than the tributaries because of the higher flushing rates in these estuaries.

State agencies and local organizations are committed to monitoring coastal waters to learn more about water quality pollutants and their sources. Additional opportunities for water quality improvement are available through local implementation of growth management bylaws and regulations related to the design and development of subdivisions, stormwater management, and wetlands protection. In addition, by working with regional and state agencies, local governments can target areas where elevated pollutant levels exist, such as at particular storm drains or where agricultural waste and industrial pollution are high. *Refer to Appendix A for a list of agencies and organizations that focus on water quality issues.*

SHELLFISH RESOURCES



Historically, both Plum Island Sound and Essex Bay have been major shellfishing areas with six species being harvested in the region: soft-shell clam, surf clam, blue mussel, razor clam, oyster, and ocean quahog (Buchsbaum and Purinton 2000). The soft-shell clam is the most economically important shellfishery and supports a community of harvesters, distributors, processors, and restaurant owners in the ACEC region. Shellfish populations are dynamic and unpredictable, but there is general consensus that productivity is currently low due to cumulative impacts of over-harvesting and predation over the past 20 years. In addition, longer regulatory shellfish bed closures, as a result of increased land-based pollution following rainfall events, are a concern to many harvesters throughout the region.

The Town of Ipswich has made considerable attempts to improve coastal pollution and protect shellfish resources. In the fall of 1999, shellfish beds opened in Fox and Treadwell Island Creeks due to successful water quality remediation efforts by the town and the Ipswich Coastal Pollution Control Committee (see the Case Studies section). In addition, a partnership between the Rowley Marine Advisory Board, Merrimack Valley Planning Commission, Eight Towns and the Bay, the Northeast Massachusetts Aquaculture Center, and officials in Gloucester, Ipswich, and Rowley are successfully researching the feasibility of rearing soft-shell clams for both private and public use by investigating techniques of hatchery production and wild seed harvesting (see the Case Studies section). These initiatives, combined with stormwater best management practices and wastewater management, will help maintain healthy shellfish populations in the future. *Refer to Appendix A for a list of agencies and organizations that focus on shellfish issues.*

WETLANDS

With approximately 10,000 acres of salt marsh, the ACEC includes the largest continuous salt marsh system in New England and is part of a region known locally as the "Great Marsh." ACEC salt marshes are protected under the Massachusetts Wetlands Protection Act, through local wetlands bylaws and regulations, and through ownership or management by municipalities and conservation agencies. Although much of the salt marsh is still relatively pristine, there are concerns of human alterations and impacts to these habitats such as tidal restrictions, including culverts and dikes, which impede the natural tidal flow. These restrictions lead to a change in native vegetation with as the invasive species *Phragmites* encroaches on degraded salt marsh habitats. A Massachusetts Audubon study in 1996 determined that although *Phragmites* have not taken over a large percentage of the region so far, it is widespread and occurs in stands ranging from a few plants to several acres (Buchsbaum 1996). Since *Phragmites* stands are considered of less value to wildlife than native salt marsh species, these sites are being targeted by resource managers for restoration and monitoring efforts. In addition to tidal alterations, monitoring results indicate that developing land adjacent to wetland habitats causes water pollution, habitat impacts, and changes in native plant and invertebrate communities (Smith 1999). Disturbance to these "edge habitats" resulting from surrounding development and stormwater runoff is estimated to worsen as pressures increase on the fringe of salt marsh environments.

Two proactive volunteer restoration programs managed by state agencies are underway in the ACEC. The state Wetlands Restoration Program (WRP) is working with volunteer professional scientists to monitor salt marsh restoration sites. Over 60 scientists are part of this program, which monitors vegetation, fish, macroinvertebrates, hydrology, and salinity both before and after a restoration project takes place. In addition, citizen volunteers are monitoring restoration sites through the Wetlands Health Assessment Toolbox (WHAT) program. CZM, the University of Massachusetts Cooperative Extension Program, and the Massachusetts Bays National Estuary Program have developed the WHAT approach to assessing wetland quality and ecological health through volunteer monitoring at different sites in the ACEC region. Each of the study sites have all been adversely affected by tidal restrictions, stormwater discharges, and nonpoint source pollution from urban development. Parameters monitored by volunteers at each site include: avifauna, vegetation, aquatic macroinvertebrates, water chemistry, tidal influence, and land use. From data collected, CZM wetland specialists can quantify the intensity of human land use within 100 meters of the salt marsh study site. By engaging citizens, WHAT partners hope to foster



photo by Robert Buchsbaum

stewardship of wetlands and further educate communities about complicated issues surrounding wetland values and functions. ACEC municipalities can address some of these salt marsh concerns by using local bylaws and regulations to protect wetland resources from surrounding development. *Refer to Appendix A for a list of agencies and organizations that focus on salt marsh and wetland issues.*



BARRIER BEACHES

Barrier beaches are found in most ACEC communities; according to *An Inventory of the Coastal Resources of the Commonwealth of Massachusetts* (Hankin et al. 1985), Gloucester has 172 acres, Ipswich has 1,333 acres, Newbury has 607 acres, and Rowley has 186 acres of barrier beach. In addition, Plum Island and Crane Beach are the fourth and sixth largest barrier beach landforms in Massachusetts. Barrier beach systems are dynamic landforms that undergo constant change and provide a variety of public benefits, including recreation, wildlife habitat, and storm protection (MBBTF 1994).

Federal, state, and local agencies have a variety of jurisdictional interests in beaches and dunes. Local governments play an important role as commissions, committees, and boards review proposals for construction activities in these resource areas. A number of activities that take place on beaches are appropriate for review under the Wetlands Protection Act such as construction, Off Road Vehicle (ORV) use, beach nourishment, dune construction, or restoration projects (Massachusetts Wetlands Protection Act, G.L. c. 131, s. 40). However, "passive" recreational activities that are not likely to alter beaches, such as foot traffic, boating, and horseback riding, would not be subject to the Act (MBBTF 1994). Inappropriate development on barrier beaches, coastal beaches, and dunes can cause erosion and modification of the beach or dune, resulting in severe economic loss to residents and to local, state, and federal governments.

On Plum Island, the Towns of Newbury and Newburyport are trying to address issues of growth management, water supply, and water quality through an agreement to extend water and sewer services to this barrier beach. The agreement includes measures for conserving water and for assuring that utility extensions do not promote further development on Plum Island. Responsible beach and dune management involves protecting the public interests and carefully balancing the needs of many competing user groups. *Refer to Appendix A for a list of agencies and organizations that focus on barrier beach issues.*

OPEN SPACE AND GROWTH MANAGEMENT

One primary reason the ACEC is still relatively pristine is because a large percentage of coastal wetlands and surrounding uplands are protected as conservation land and wildlife sanctuaries. However, ACEC communities are continuing to experience significant population increases. As new residents are drawn to the character and beauty of the area, homes and subdivisions are being built while more open space is being lost. If current trends of sprawling development continue, many of the natural wild places will be destroyed or severely fragmented, and the community character and quality of life in cities and towns will be diminished (Steele 1999). Degradation of community character can come with the abandonment of existing residential city and town centers, increased traffic, longer commutes, and more isolated lifestyles. Growth not only changes the character of North Shore communities, but also alters areas once dominated by forests, farmland, and coastal resources. Based on Massachusetts Executive Office of Environmental Affairs (EOEA) buildout analysis, population



and development in each of the ACEC towns are project to increase (Table 1).

Table 1. Projected population growth in ACEC towns		
Town	Residents (1998/99)	Projected Buildout Populations
Newbury	6,970	11,896
Rowley	5,343	11,395
Ipswich	12,768	22,833
Essex	3,566	11,852
Gloucester	29,252	38,961

[Results for Newbury were estimated as part of the Plum Island Sound Minibay Project (Buchsbaum 1996) while Rowley, Ipswich, Essex, and Gloucester estimates were derived from the 1999-2000 EOEa buildout analysis].

Although many ACEC communities lack formal growth management plans, local and regional groups are taking steps to address the issue. Open space inventories, secured revenue for open space acquisition, community planning forums, and new concepts in subdivision design are being used by ACEC communities to varying degrees. Technical and funding support through the state's Community Preservation Act, Executive Order 418, and buildout analyses provide additional tools that communities may take advantage of to further their planning goals. Efforts to incorporate growth management strategies into local bylaws and regulations are under way in some ACEC communities and continue to be a priority for resource managers in the region. *Refer to Appendix A for a list of agencies and organizations that focus on open space and growth management issues.*